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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,303	06/30/2003	Hung C. Lin	MSI-3	8978
7590 04/06/2004			EXAMINER	
Hung Chang LIN 8 Schindler Ct. Silver Spring, MD 20903			NGUYEN, MINH T	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

in

<b>Office Action Summary</b>	<b>Application No.</b> 10/608,303	<b>Applicant(s)</b> LIN ET AL.	
	<b>Examiner</b> Minh Nguyen	<b>Art Unit</b> 2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 12-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 15-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species I: a quadrature frequency generator having the structure shown in Fig. 3e, i.e., differential structure, claims 4-11.

Species II: a quadrature frequency generator having the structure shown in Fig. 5a, i.e., MOSFET conductance structure, claims 12-14.

2. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, 1 is generic.

3. A telephone call was made to an attorney of record on 4/1/04 to request an oral election to the above restriction requirement, species I is elected. The following is a detailed Office action of claims 1-11 and 15-16.

### ***Specification***

4. The disclosure is objected to because of the following informalities: page 3, line 20, "PMOS current mirror M3 and M4" should be changed to -- PMOS current mirror M4 and M5 -- , see Fig. 4. Appropriate correction is required.

***Claim Objections***

5. Claim 1 is objected to because of the following informalities: line 4, “first multiplicand” should be changed to -- *the* first multiplicand --. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1- 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the claim is indefinite because it fails to particularly point out if the second multiplicand is receiving a signal and the output is outputting a signal, or the second multiplicand is outputting a signal and the output is receiving a signal. If the recitation means the second multiplicand is receiving a signal and the output is outputting a signal, the recitation a quadrature ac signal *derived* from the second multiplicand is misdescriptive. If the recitation means the second multiplicand is outputting a signal and the output is receiving a signal, the term “second multiplicand” is misdescriptive because one of ordinary skilled in the art would not consider a second multiplicand in a multiplier as an output. Further, as shown in Fig. 2 of the present invention, the second multiplicand V2 is inputting a quadrature ac signal, not outputting the quadrature ac signal. Further, Fig. 3e of the present invention clearly shows the VQ signal is the input signal in addition to the VI signal in order for the circuit to function. The term “in-

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phase ac signal” is unclear, i.e., it is unclear if there is any special meaning for the words “in-phase” used in the claim, clarification is requested.

As per claim 15, the same problem exists as noted in claim 1 regarding the recitation the second multiplicand is outputting a signal.

As per claims 2-11 and 16, these claims are rejected because of the indefiniteness of claims 1 or 15.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11 and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,659,263, issued to Dow et al.

As per claim 1, Dow discloses a quadrature frequency generator (Fig. 2), comprising:  
a multiplier (200) having a first multiplicand (221), a second multiplicand (223) and an output (VPHASE, 225 and 226) equal the multiplication of the first multiplicand and the second multiplicand (because 200 is a multiplier);

a in-phase ac signal (VIN) applied to the multiplier as the first multiplicand (221); and  
a quadrature ac signal (VQUAD) derived from the second multiplicand (223) by setting said output to zero ac signal (column 4, lines 8-10, when VIN and VQUAD are in quadrature, VPHASE is zero).

As per claim 2, the Dow's multiplier (Fig. 2) is clearly analog.

As per claim 3, the names VIN and VQUAD indicate they are voltages.

As per claim 4, the Dow's multiplier is clearly differential, having: a differential pair (203 and 204) fed by a source (201) wherein the source (201) is controlled by the in-phase voltage (VIN), the output (VPHASE) is derived as recited, and the quadrature ac voltage (VQUAD) is derived from the differential input (223).

As per claim 5, see column 3, lines 50-60, i.e., bias voltage VB1 is applied to terminal (224) when VQUAD is not applied to nodes (223 and 224).

As per claims 6-7, see Fig. 1, VPHASE is connected to the loop filter (13), as known by anyone skilled in the art, a loop filter in a PLL circuit includes capacitor to short the ac signal to ground and to retain the DC bias.

As per claim 8, the recited limitation is merely the result when the VPHASE is zero and the (VIN) and (VQUAD) are 90 degrees out of phase.

As per claim 9, see column 3, lines 60-63.

As per claims 10-11, rejected for the same reasons as claims 6-7.

As per claim 15, this claim is merely a method to operate a quadrature frequency generator having the structure discussed in claim 1, since Dow teaches the circuit, he inherently teaches the recited method.

As per claim 16, rejected for the same reason noted in claim 2.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is 571-272-1748. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



4/11/04

Minh Nguyen  
Primary Examiner  
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